

Attorney Docket No. 01708/HG

**IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE**

Applicant(s): Takeo WATANABE et al

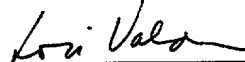
Serial No. :

Filed : Concomitantly herewith

For : METHOD OF MANUFACTURING  
GLASS SUBSTRATE FOR  
INFORMATION RECORDING  
MEDIA, GLASS SUBSTRATE  
FOR INFORMATION RECORDING  
MEDIA MANUFACTURED USING  
THE METHOD, AND INFORMATION  
RECORDING MEDIUM USING THE  
GLASS SUBSTRATE

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Lori Valdes

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**PRELIMINARY AMENDMENT FILED  
CONCOMITANT WITH APPLICATION**

Assistant Commissioner for Patents  
Washington, D.C. 20231

S I R :

Please amend the application as follows:

**IN THE CLAIMS:**

11. (Amended) A method as claimed in claim 1, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

19. (Amended) An information recording medium comprising a glass substrate for information recording media as claimed in claim 16 with an information recording film formed on at least one major surface thereof.

20. (Amended) An information recording medium comprising a glass substrate for information recording media as claimed in claim 16 wherein said glass substrate has an information recording film selected from the group consisting of a magnetic recording film, an optical magnetic recording film, and an optical recording film is formed on at least one major surface thereof.

Please add the following claims 9-16:

22. (New) A method as claimed in claim 7, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

23. (New) A method as claimed in claim 8, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

24. (New) A method as claimed in claim 9, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

25. (New) A method as claimed in claim 10, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

26. (New) A method as claimed in claim 22, wherein the ratio of the energy density of the laser beam on the outer peripheral edge surface to the energy density of the laser beam on the inner peripheral edge surface is in a range of 2 to 5.

27. (New) A method as claimed in claim 23, wherein the ratio of the energy density of the laser beam on the outer peripheral edge surface to the energy density of the laser beam on the inner peripheral edge surface is in a range of 2 to 5.

28. (New) A method as claimed in claim 24, wherein the ratio of the energy density of the laser beam on the outer peripheral edge surface to the energy density of the laser beam on the inner peripheral edge surface is in a range of 2 to 5.

29. (New) A method as claimed in claim 25, wherein the ratio of the energy density of the laser beam on the outer peripheral edge surface to the energy density of the laser beam on the inner peripheral edge surface is in a range of 2 to 5.

30. (New) An information recording medium comprising a glass substrate for information recording media as claimed in claim 17 with an information recording film formed on at least one major surface thereof.

31. (New) An information recording medium comprising a glass substrate for information recording media as claimed in claim 18 with an information recording film formed on at least one major surface thereof.

32. (New) An information recording medium comprising a glass substrate for information recording media as claimed in claim 17 wherein said glass substrate has an information recording film selected from the group consisting of a magnetic recording film, an optical magnetic recording film, and an optical recording film is formed on at least one major surface thereof.

33. (New) An information recording medium comprising a glass substrate for information recording media as claimed in claim 18 wherein said glass substrate has an information recording film selected from the group consisting of a magnetic recording film, an optical magnetic recording film, and an optical recording film is formed on at least one major surface thereof.

34. (New) An information recording medium as claimed in claim 30, wherein the information recording film is a magnetic recording film.

35. (New) An information recording medium as claimed in claim 31, wherein the information recording film is a magnetic recording film.

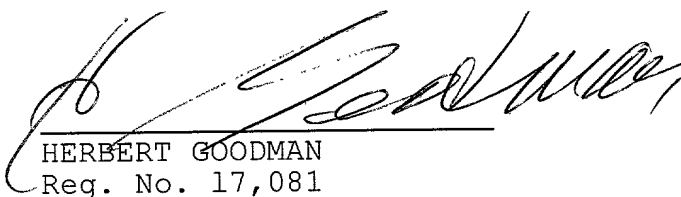
**REMARKS**

The present amendment removes all multiple dependent claims without changing the scope of coverage.

A copy of the original claim pages which contain the amended claims with the amendments marked thereon is attached hereto.

Entry of the present amendment is solicited.

Respectfully submitted,

  
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Enc.: Marked up copy of amended claims

single laser oscillator, splitting the laser beam into two split laser beams, and simultaneously irradiating the two split laser beams onto the inner peripheral edge surface and the outer peripheral edge surface  
5 respectively.

8. A method as claimed in claim 5, wherein the smoothing step comprises emitting a laser beam from each of two laser oscillators, and irradiating the laser beam emitted from one of the laser oscillators onto the inner  
10 peripheral edge surface, and irradiating the laser beam emitted from the other laser oscillator onto the outer peripheral edge surface.

9. A method as claimed in claim 1, wherein the at least one laser beam is a divergent beam.

10. A method as claimed in claim 1, wherein the glass disk is rotated during the smoothing step such that a speed of the inner peripheral edge surface relative to the laser beam is in a range of 0.02 to 5.0 m/minute.

11. <sup>Amended</sup> A method as claimed in <sup>claim 1</sup> any one of claims 6 through 10, wherein a ratio of an energy density of the laser beam on the outer peripheral edge surface to an energy density of the laser beam on the inner peripheral edge surface is more than 1.

12. A method as claimed in claim 11, wherein the  
25 ratio of the energy density of the laser beam on the outer peripheral edge surface to the energy density of the laser beam on the inner peripheral edge surface is in a range of 2 to 5.

13. A method as claimed in claim 1, wherein all or  
30 part of the glass disk is heated using a resistive heater before or during the smoothing step.

14. A method as claimed in claim 1, further comprising grinding and polishing at least one major surface of the glass disk after the smoothing step.

35 15. A method as claimed in claim 14, wherein a

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mother glass of the glass disk is a silicate glass containing one compound selected from the group consisting of  $\text{Li}_2\text{O}$  and  $\text{Na}_2\text{O}$  as an alkaline oxide component, and the method further comprises the step of carrying out chemical strengthening treatment wherein an alkaline metal ions of the alkaline oxide component in a surface layer of the glass disk is replaced with an alkaline metal ions having larger ionic radius, after the grinding and polishing of the at least one major surface of the glass disk have been carried out.

16. A glass substrate for information recording media prepared using the method claimed in claim 1.

17. A glass substrate for information recording media as claimed in claim 16, wherein an average roughness  $R_a$  of at least one of the inner peripheral edge surface and the outer peripheral edge surface is in a range of 0.001 to  $0.3\mu\text{m}$ .

18. A glass substrate for information recording media as claimed in claim 16, wherein a maximum roughness  $R_{\text{max}}$  of at least one of the inner peripheral edge surface and the outer peripheral edge surface is in a range of 0.01 to  $2\mu\text{m}$ .

19. <sup>(Amended)</sup> An information recording medium comprising a glass substrate for information recording media as claimed in <sup>claim 16</sup> any one of claims 16 to 18, with an information recording film formed on at least one major surface thereof.

20. <sup>(Amended)</sup> An information recording medium comprising a glass substrate for information recording media as claimed in <sup>claim 16</sup> any one of claims 16 to 18, wherein said glass substrate has an information recording film selected from the group consisting of a magnetic recording film, an optical magnetic recording film, and an optical recording film is formed on at least one major surface thereof.

21. An information recording medium as claimed in